To: womt@water.ca.gov[womt@water.ca.gov]
From: "Johns, Jerry"
Sent: Mon 12/22/2008 4:58:19 AM
Subject: FW: Diurnal activity patterns in salmon
Temporal patterns in salmon.doc
Webb_et_al_CALFED_Diel_other_spp.pdf
wilderrm@saic.com
www.saic.com

Something to keep in mind as the year progresses.

Jerry Johns

Depuy Director, DWR

From: Wilder, Richard M. [mailto:RICHARD.M.WILDER@saic.com]
Sent: Thursday, December 18, 2008 9:39 AM
To: John Cain
Cc: Cylinder, Paul D.; Laura King Moon; david_harlow@sbcglobal.net; Johns, Jerry
Subject: Diurnal activity patterns in salmon

John,

I am a bit concerned that the work Jon Burau is doing on salmon at the DCC is going to influence the BDCP process into thinking that allChinook salmon migrate at night and hold during the day. As the attached data indicate (look at the figures at the end of the manuscript for the striking patterns), late fall Chinook do indeed do this during the winter, but the pattern is the complete opposite during the spring. During this time of year, fall-run Chinook salmon are diurnal, not nocturnal. The USFWS has done 24 hour sampling many times (even more than I have in the manuscript) and the patterns are nearly always consistent spatially and temporally. This will become very important if we start saying things in BDCP documents such as "operate the DCC gates during the summer to be open during the day and closed at night." Although we are not sure how the fish behave during this time of year (only winter and spring), I suspect that they are in fact diurnal, thus having the exact OPPOSITE effect on salmon of what we would be trying to achieve. With a little bit of money, we could figure out

There are many hypotheses as to why Chinook salmon switch activity patterns (I think some combination of temperature, predation risk, and turbidity are most promising), but no one really knows why for sure. Further, this is not unique to Chinook salmon. There are many studies showing diel patterns in other salmonids throughout the word. Also, researchers at UC Davis (Eric Chapman and others that are part of the acoustic tagging studies) have found that activity patterns switch spatially. See Chapman's 2008 CALFED conference abstract for more info.

Incidentally, many other species, including delta smelt and splittail, exhibit diel patterns, as can be seen in a poster we put together for the 2006 CALFED conference (attached). I know that Lenny Grimaldo has found similar patterns for delta smelt in salvage numbers at the pumps. These patterns could be considered as we move forward with the operational planning process.

I'd be happy to expand on this at a future Integration Team meeting.

Thanks,

Rick

Rick Wilder, PhD

Senior Fisheries Biologist

SAIC

1810 S Street

Sacramento, CA95811

916-446-3980

916-533-5293 (cell)

wilderrm@saic.com

www.saic.com